

## SECTION 08710

### DOOR HARDWARE

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**Edit entire Section eliminating references to requirements for fire rated doors if there are none in the project.**

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#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Hardware for [wood] [hollow steel] [aluminum] [ ] doors.
- B. Thresholds.
- C. Gaskets.

##### 1.2 LANL FURNISHED AND INSTALLED EQUIPMENT

- A. Permanent lock cylinder cores and keying.

##### 1.3 RELATED SECTIONS

- A. Section [16721] [16722] - Fire Alarm and Smoke Detection System: Electrical connection to activate door closers.

##### 1.4 SUBMITTALS

- A. Submit the following in accordance with the requirements of Section 01300.
  - 1. Catalog data for each item of hardware. Include whatever information may be necessary to show compliance with the specified requirements, and include instructions for installation and for maintenance of operating parts and finish.
  - 2. Materials list in the form of a final hardware schedule in manner indicated below. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.
  - 3. Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
    - a. Type, style, function, size and finish of each hardware item.
    - b. Name and manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of hardware set cross-referenced to indications on Drawings.
    - e. Explanation of all abbreviations, symbols, codes, etc. contained in schedule.
    - f. Mounting locations for hardware.
    - g. Keying information.

4. Submittal Sequence: Submit hardware schedule at earliest possible date, particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames). Include with hardware schedule, the project data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.
  5. Provide 5 year warranty on materials and installation workmanship on all door hardware items provided under this Section. Repair or replace all failed items.
- B. Furnish a complete set of specialized tools and maintenance instructions as needed for LANL's continued adjustment, maintenance, and removal and replacement of finish hardware.

## 1.5 COORDINATION

- A. Supply templates to manufacturers for door and frame preparation.

## 1.6 QUALITY ASSURANCE

- A. Use products of manufacturers specializing in manufacture of door hardware.
- B. Use a hardware supplier specializing in supplying commercial door hardware.

## 1.7 REGULATORY REQUIREMENTS

- A. Conform to NFPA 80 - Standard for Fire Doors and Windows where applicable.
- B. Conform to NFPA 101 - Life Safety Code, Chapter 5.
- C. Provide hardware for fire-rated assemblies which has been tested and listed by UL or FM for types and sizes of doors required, and which complies with requirements of door and door frame labels.
1. Provide fire exit hardware bearing UL or FM label indicating "Fire Exit Hardware" at scheduled fire-rated assemblies.

## 1.8 PRODUCT HANDLING

- A. Tag or package each item separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the Work will not be delayed by hardware losses, both before and after installation.

## PART 2 PRODUCTS

### 2.1 PRODUCTS

- A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware are indicated in the Finish Hardware Data Sheet and Hardware Schedule at the end of this Section. Products are identified by using hardware designation numbers of ANSI/BHMA.
- B. ANSI/BHMA designations are used in this Section to describe hardware items or to define quality or function. Provide hardware complying with the following standards:

1. Butts and Hinges: ANSI A156.1 (BHMA 101)
2. Locks and Lock Trim: ANSI A156.2 (BHMA 601)
3. Exit Devices: ANSI A156.3 (BHMA 701)
4. Door Controls - Closers: ANSI A156.4 (BHMA 301)
5. Auxiliary Locks: ANSI A156.5 (BHMA 501)
6. Architectural Door Trim: ANSI A156.6 (BHMA 1001)
7. Template Hinge Dimensions: ANSI A156.7
8. Door Controls - Overhead Holders: ANSI A156.8 (BHMA 311)
9. Interconnected Locks and Latches: ANSI A156.12 (BHMA 611)
10. Mortise Locks and Latches: ANSI A156.13 (BHMA 621)
11. Cylindrical Locks and Latches: ANSI/BHMA A156.2
12. Auxiliary Hardware: ANSI A156.16 (BHMA 1201)
13. Materials and Finishes: ANSI A1156.18 (BHMA 1301)

## 2.2 MATERIALS AND FABRICATION

### A. General:

1. Drawings show direction of swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
2. Do not use manufacturer's products which have manufacturer's name or trade name displayed in a visible location except in conjunction with required UL labels and approved by LANL.
3. Produce hardware units of basic metal and forming method indicated, using the manufacturer's standard metal alloy, composition, temper and hardness. Construction of hardware units must conform with applicable ANSI A156 series standard for each type hardware item and with ANSI A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, unless specified otherwise.
4. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws.
5. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws unless otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish, or if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.
6. Provide concealed fasteners for hardware units which are exposed when door is closed, unless no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex bolt fasteners.

## 2.3 HINGES AND BUTTS

- A. Templates: Provide only template-produced units, except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames.
- B. Provide butts of five knuckle, ball bearing type.
- C. Screws: Use Phillips flat-head or machine screws for installation of units, except use Phillips flat-head or wood screws for installation of units into wood. Finish of screw heads shall match surface of hinges or pivots.
- D. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
  - 1. Steel Hinges: Steel pins.
  - 2. Non-ferrous Hinges: Stainless steel pins.
  - 3. Exterior Doors: Non-removable pins.
  - 4. Out-swing Corridor Doors: Non-removable pins.
  - 5. Interior Doors: Non-rising pins.
  - 6. Tips: Flat button and matching plug, finished to match leaves.
  - 7. Number of Hinges: Provide number of hinges indicated but not less than 3 hinges per door leaf for doors 90 inches or less in height and one additional hinge for each 30 inches of additional height or fraction thereof.

## 2.4 LOCK CYLINDERS AND KEYING

- A. Provide Best locks with Best 1C7G1, 7 pin interchangeable core inserts. Furnish cylinders with construction cores for construction period. Provide 15 construction masterkeys and 2 control keys. Permanent cores and keying will be furnished and installed by LANL. Furnish control keys to LANL for use in installing permanent cores.
- B. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.

## 2.5 LOCKS, LATCHES AND BOLTS

- A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.
  - 1. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.
  - 2. Provide roller type strikes where recommended by manufacturer of the latch and lock units.
- B. Lock Throw: Provide 5/8 inch minimum throw of latch and deadbolt used on pairs of doors. [Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.]
- C. Flush Bolt: Provide minimum 1/2 inch diameter rods of brass, bronze or stainless steel, with minimum 12 inch long rod for doors up to 7 feet in height. Provide longer rods as necessary for doors exceeding 7 feet in height.

D. Mortise Type Locksets and Latchsets:

1. Provide Best heavy duty mortise type locksets with hinged, anti-friction, 3/4 inch throw latchbolt with anti-friction piece made of self-lubricating stainless steel. Functions and design to be as indicated in the hardware groups description. Deadbolt functions shall be one inch projection with 2 hardened steel roll pins. Both deadbolt and latchbolt shall extend into lock case a minimum of 3/16 inch when fully extended.
2. Provide Best 35H Series locksets with style 3 levers and style [C rose and/or G escutcheon], no substitution.
3. Provide locksets that will accept LANL supplied Best 1C7G1, 7 pin interchangeable core cylinders. All mortise cylinders to have a concealed internal set screw for securing the cylinder to the lockset. The internal set screw shall be accessible only by removing the core from the cylinder body.
4. Locksets shall conform to ANSI A156.13, Series 1000, Operational Grade 1, Security Grade 2 and be UL listed for fire.
5. Provide locksets that fit ANSI A 115.1 door preparation.
6. Locksets shall have self-aligning, thru-bolted trim.
7. Auxiliary deadlatch shall be made of one piece stainless steel, permanently lubricated.
8. Use locksets with tactile or knurled levers for identification of hazardous areas, i.e., Electrical Room.
9. Levers shall be of reinforced bronze or brass material, polished chrome finish, US 26, and conforming to ANSI A117.1.
10. Spindle shall be of type that twists first, then breaks, thus preventing forced entry. Key shall still operate the latchbolt, allowing operation until lock is repaired.
11. Levers shall be operated with a roller bearing spindle hub mechanism.
12. Permanent core face shall be the same finish as the lockset finish.
13. Each lever shall have its own independent lever spring which must not interfere with the changing of lockset handling.

E. Cylindrical Type Locksets:

1. Provide Best extra heavy duty cylindrical type latchsets and locksets with 2-3/4 inches backset, with a 9/16 inch throw latchbolt.
2. Provide Best 9K Series locksets with style 14 levers and style D rose, no substitutions.
3. Provide locksets with Best 1C7G1, 7 pin interchangeable cores.
4. Locksets shall conform to ANSI A156.2, Series 4000, Grade 1, [and shall be (UL listed for fire rated.)]
5. Provide locksets that fit ANSI A115.2 door preparation.
- [6. Use locksets with tactile or knurled levers for identification of hazardous areas.]

7. Locks shall have solid shanks with no opening for access to keyed knob keeper.
8. Keyed lever shall be removable only after core is removed with authorized control key, to allow access to knob "keeper".
9. Spindles of locksets shall be made of stainless steel.
10. Locks shall be of thru-bolted design.
11. Permanent core face shall be the same finish as the lockset finish.

## 2.6 EXIT DEVICES

- A. Exit devices must conform to ANSI A156.3, Grade I, NFPA 101 and [NFPA 80 for fire rated doors.]
- B. Provide Von Duprin 99 series exit devices in rim, mortise, surface vertical rod or concealed vertical rod type, panic or fire rated, as scheduled at end of this Section.
- C. Except on fire-rated doors, wherever closers are provided on doors equipped with exit devices, provide exit device with keyed dogging device to hold the push bar down and the latch bolt in the retracted position. These devices shall be convertible from hex key dogging to a high security cylinder dog operation in the field.
- D. Devices shall be non-handed and capable of direct field conversion for all available trim functions.
- E. Devices shall be of push-through type touch pad design, with a straight or horizontal motion to eliminate pinch points.
- F. Exit devices shall have hydraulic sound dampers.
- G. All working parts must be made of stamped steel.
- H. Latch bolts must be self-lubricating to reduce friction and wear.
- I. All rim, vertical rod and mortise lock devices shall have the capability of electric latch retraction. Manufacturer must have accessory products available, including power supplies, monitoring switches and controls to complete the system. All components must be UL listed.

## 2.7 CLOSERS AND DOOR CONTROL DEVICES

- A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.
  1. Where parallel arms are indicated for closers, provide closer unit one size larger than recommended for use with standard arms.
- B. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying with ANSI A117.1 provisions for door opening force and delayed action closing.
- C. Door closers shall conform to ANSI 156.4, Types CO2011 for interior and exterior in-swinging door and CO2021 for exterior and corridor out-swinging doors.
- D. Door stops shall conform to ANSI 156.16. Stops shall be BHMA L42101, L42251, L12141 or L12161 to suit conditions. Provide grey resilient parts for exposed bumpers.

## 2.8 DOOR TRIM UNITS

- A. Fasteners: Provide manufacturer's standard exposed fasteners, either machine screws or self-tapping screws, for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units).
- B. Fabricate edge trim items of anodized aluminum, in length of not more than 1/2 inch nor less than 1/16 inch smaller than door dimension.
- C. Fabricate kickplates not more than 1-1/2 inches less than door width and 12 inches high. Kickplates shall conform to ANSI 156.5, Type J102. Plates shall be a minimum of 0.050 inch thick stainless steel with finish to be US 32.

## 2.9 WEATHERSTRIPPING

- A. General: Except as otherwise indicated, provide continuous weatherstripping at each edge of every exterior door leaf. Provide non-corrosive fasteners as recommended by manufacturer for application indicated.
- B. Replaceable Seal Strips: Provide only units for which resilient seal is easily replaceable and readily available from stocks maintained by manufacturer.

## 2.10 THRESHOLDS

- A. General: Except as otherwise indicated, provide standard metal threshold unit of type, size and profile as scheduled.

## 2.11 HARDWARE FINISHES

- A. Provide matching finishes for hardware units at each door or opening, to the greatest extent possible, and except as otherwise indicated. Finish for all items shall be US 26, polished chrome or US 32, polished stainless steel except closers which shall be a spray paint finish to match hardware, thresholds which shall be mill finish aluminum and weather- stripping and gasketing which shall be clear or bronze anodized aluminum.
- B. Provide finishes which match those established by BHMA.
- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for the applicable units of hardware by referenced standards.
- D. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI A156.18 "Materials & Finishes Standard", including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Verify that doors and frames are ready to receive hardware and that dimensions are as [indicated on shop drawings.] [instructed by the manufacturer.]
- B. Verify that power supply is available to power operated devices.
- C. Verify that in-place construction on which this work is dependent is free of defects which may influence satisfactory completion and performance of the work. Beginning of installation means acceptance of in-place construction.

### 3.2 INSTALLATION

- A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute (DHI).
- B. Conform to ANSI A117.1 for positioning requirements for the handicapped.
- C. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrate.
- D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- F. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.

### 3.3 ADJUST AND CLEAN

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- D. During the final adjustment of hardware, instruct LANL's personnel in proper adjustment and maintenance of hardware and hardware finishes.

### 3.4 SCHEDULE

The following list shows manufacturers and materials abbreviations:

S	=	H. Soss
Y	=	Yale
B	=	Best
DCI	=	Door Controls International
NG	=	National Guard
GJ	=	Glynn Johnson
T	=	Trimco
VD	=	Von Duprin
ST	=	Stanley
F	=	Function
SNB	=	Sex Nuts & Bolts
MS & LA	=	Machine Screws & Lead Anchors



HW Set 1  
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**Sample below**  
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Door 101, 243, 302, 346

3 pr.	Butts 450 TBB 26	S
1	Lockset 35H7N3C625	B
1	Cylinder 1E74 26	B
1 set	Auto Flush Bolt 845 NH 26	DCI
1	Dust Proof Strike 80 26	DCI
2	Closers 3500 x SNB SB	Y
1	Smoke Seal FS110A	NG
1	Astragal FS115A	NG
1	Coordinator 672 x 2-601AB PC	DCI

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**Be sure to specify BHMA function of lockset/latchset**  
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END OF SECTION